

TRANSACTIONS  
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- I. *On the Habits of the "Drivers" or Visiting Ants of West Africa.* By Rev. THOMAS S. SAVAGE, M.D., of Cape Palmas, Corr. Mem. of the London Ent. Soc.; Boston Nat. Hist. Soc.; National Inst., Washington; D.C., &c. (In a letter addressed to J. O. Westwood, Esq., Sec. Ent. Soc. London.)

Fishtown, near Cape Palmas, W. A.  
5th August, 1845.

DEAR SIR,

IN compliance with a promise in former letters, I proceed to give you my "Notes upon the Habits of certain Species of Ants in the vicinity of Cape Palmas, W. A." You will bear in mind, however, that I am still pressed with duties of higher moment, and can devote to these observations such hours only as are needed for recreation.

As on former occasions, I have avoided all attempts at technical descriptions, thus giving myself more time to investigate the habits of my specimens and transmit more frequently. I feel the less reluctance in doing this, knowing your ability, and being assured that with the same specimens before you nothing will be lost in this respect to science or Africa.

Great confusion exists, it would seem, in the accounts of travellers respecting the ants generally of this country, often being characterized as a whole by traits that belong to particular genera or species only; one author copying from another, and none making more than casual observations, unless it be Smeathman, whose attention was given chiefly to the habits of the *Termes fatale*, or white ants proper.

My present notes have respect to one species only of the family of *Formicidæ*. In a subsequent communication I propose to speak of the *Termes fatale*, but so far only as I may discover new facts and detect inaccuracies in the accounts already published.

The insect in question is known here under the *significant* name of "Driver." I am not aware that it has ever been described or that it exists in any of the European Cabinets. It would, however, be strange if an insect of almost equal prominence with the *Termes fatale*, and acting a far more important practical part in the economy of nature, should be found, at this day, without "a local habitation and a name" in some of your Systems of Classification.

From the careless and casual manner in which the "ants of Africa" have been spoken of by some authors, I am inclined to think that it has been noticed under the name of "*Termes viarum*;" not by Smeathman, for his account of that insect indicates radical differences between it and mine, though they possess some traits in common.

Mr. Robert Clark, surgeon to the colony of Sierra Leone, in a work recently published, enumerating "the ants" of that region, gives by name the five species of Smeathman's *Termes*, and in the same connection remarks, that "the travelling ants, or *Formicæ viarum*, will occasionally march into houses, where they devour everything eatable they can find." I am at a loss to know what ant he could have in his mind other than the "Driver" of this region; but if, by "everything eatable," he refers to the food of man, he is mistaken, for there are many things edible to us that they will not touch; and if by it he means "everything eatable" to the insect itself, he gives us no information of its habits in this respect, for he states neither what it will eat nor what it will not.

Again, in close connection he says, "I have often been assailed in some tracts by a highly fetid odour emanating from the copewood skirting the road side; the odour not unlike the stench proceeding from the carcass of a dead horse, being concentrated, as it were, in one place. The natives invariably speak of the stench

described as proceeding from dense masses of the travelling ants near or at the locality."—(page 123.) There can be no doubt that he speaks here of the "Driver;" but he is much mistaken, and we would account for it on the ground that he founded his statement on the representations of such inaccurate observers as the native Africans. I readily recognize the odour of which he speaks; but if it proceeds from an ant at all, it is from another similar in size, colour and aspect to the largest class of the "Drivers." It passes among the colonists at Cape Palmas under the vulgar name of "Bug-a-bug" (which appellation also they give to the *Termes fatale*). It does not, however, go forth in masses; indeed it does not exist in large numbers, and is comparatively rare. It is the impression of the colonists at Cape Palmas that "the stench" spoken of by Mr. Clark proceeds from this "bug-a-bug;" but it is often perceptible to an extent too great for this always to be the fact. On riding through the low grounds after a rain, or in the morning, it may be detected; but in such cases it undoubtedly has its source in the decay of animal matter. The Drivers emit no perceptible odour *per se*; did they, it would be absolutely intolerable in a dwelling-house to a person of delicate nerves, so great are their numbers. If this disagreeable odour is ever perceived among them, it must arise from their prey being in a putrescent state.

I have made these remarks, in passing, solely for the purpose of correction, and would here observe that Mr. Clark gives us in this instance, though unintentionally, a good specimen of the way in which the numerous loose and inaccurate statements that are abroad have arisen respecting this anomalous country, its productions and capabilities.

It is very probable that the insect referred to by Messrs. Kirby and Spence, on the 100th page of the 2nd volume of their Introduction, (the few particulars respecting which being derived from Prof. Afzelius,) is the one in question.

I think it is that, without doubt, of which Mr. Smeathman speaks when he says, "one species which seems at times to have no fixed habitation ranges about in vast armies. By being furnished with very strong jaws they can attack any animal whatever that impedes their progress, and there is no escape but by immediate flight or instant retreat to the water. The inhabitants of the negro villages are frequently obliged to abandon their dwellings, taking with them their children, &c., and wait till the ants have passed."—Swainson's *Geography and Classification of Animals*, p. 100, from the Preface to Drury's *Insects*, vol. iii.

Mr. Smeathman's account is correct so far as it goes, as will appear in the sequel, though the facts he gives are by no means incidental occurrences, but all in the way of its regular habits. Never having seen Drury's work (a subject of frequent regret) I do not know whether Mr. Smeathman ever gave more than this slight notice of their habits.

It is evidently closely allied to the *Atta cephalotes* of Fab., found in the West Indies and South America, and, like that named by the French "*Fourmi de visite*," would be more appropriately styled the "visiting" than the "travelling ant." The appellation "Driver," however, is still more significant, as will appear from the extract from Mr. Smeathman and my account. It not only travels and visits, in common with other species of ants, but it also *drives* every thing before it capable of muscular motion, so formidable is it from its numbers and bite; in respect to the last fact it stands unique in its habits, and, in distinction from other species of this country, may well take for its vulgar name that of *Driver*. Whether it will find its proper location technically under the genus *Formica proper* I leave you to decide, and proceed to a detailed account of its habits so far as I have observed them.

From its locomotive habits the impression, as in the case of Smeathman, has obtained, that it has no fixed habitation. This my observations go to confirm in respect both to their appearing and disappearing from certain localities, and the absence of cells or magazines. Its domicil, if such it may be called, consists of a shallow excavation under the roots of trees, shelving rocks, and almost any other substance that will afford a shelter; not originating with themselves, but adopted and completed as the wants of their community may require. The greatest depth to which I have known them penetrate is about two feet. The interior exhibits no mechanical contrivance, for which many other ants are celebrated. There is an old saying, which is not without meaning, that "a man's dwelling indicates the nature of his employment." A robber's house will not exhibit, either in or out, the indications of a permanent abode that an honest man's does; so with that of the insects before us, their mode of life will not admit of cells and magazines and other interior arrangements by which the domicils of other ants more retiring and less aggressive in their habits are characterized. The nearest approach they make to such an arrangement is the adoption of fissures in the ground, crevices in rocks, and the interstices between small stones, &c. that may fall within the compass of their dwelling-place.

Their sallies are made in cloudy days and in the night, chiefly in the latter. This is owing to the uncongenial influence of the sun, an exposure to the direct rays of which, especially when the power is increased BY REFLECTION, *is almost immediately fatal*. If they should be detained abroad till late in the morning of a sunny day by the quantity of their prey, they will construct arches over their path, of dirt agglutinated by a fluid excreted from their mouth. If their way should run under thick grass, sticks, &c., affording sufficient shelter, the arch is dispensed with; if not, so much dirt is added as is necessary to eke out the arch in connection with them. In the rainy season, or in a succession of cloudy days, this arch is seldom visible; their path, however, is very distinct, presenting a beaten appearance and freedom from every thing moveable. They are evidently economists in time and labour; for if a crevice, fissure in the ground, passage under stones, &c. come in their way, they will adopt them as a substitute for the arch. This covered way seems to be designed in part for the protection of workers in transporting prey, pupæ, &c., but chiefly *against the direct rays of the sun, an exposure to which, in places where the REFLECTION is strong, is certain death in less than two minutes*. When the sun's rays are intercepted for days, the arch is wanting; and, even with the arch, in a bright strong sunshine, masses of the Drivers are found under the thick grass in holes and other places, regaling themselves in the shade till the decline of the sun, when their work is renewed with their characteristic vigour.

In cloudy days, when on their predatory excursions, or migrating, an arch for the protection of the workers, &c. is constructed of the bodies of their largest class. Their widely extended jaws, long slender limbs, and projecting antennæ intertwining, form a sort of net-work that seems to answer well their object. Whenever an alarm is given the arch is instantly broken, and the ants, joining others of the same class on the outside of the line, who seem to be acting as commanders, guides, and scouts, run about in a furious manner in pursuit of the enemy. If the alarm should prove to be without foundation, the victory won or danger passed, the arch is quickly renewed, and the main column marches forward as before in all the order of an intellectual military discipline.

I will here describe an attempt that I recently made to destroy one of their communities, which, with the facts in the order in which they transpired, and the collateral circumstances attending it, will fairly illustrate many of their habits.

My observations were made in part at my former station (Cape Palmas), where I resided nearly eight years. I have been at my present station about eight months. During the first four months of the latter period I was greatly annoyed by the frequent visitations and ravages of these insects; at one time literally *driving* out every member of the female department of the school; at another the male department; then the inmates of my own dwelling; again, attacking my horse, then my pigs, fowls, &c. &c., nothing in fine possessing animal life escaping their assaults. They always pounced upon us at night, and generally when our senses were reposing in sleep. Occasionally we were apprised of their designs at nightfall by a few suspicious individuals lurking in the vicinity in advance of the main body, but mostly they took us by surprise. At last their annoyance seemed to have reached the highest point of our forbearance, and a resolution was forthwith taken to discover their habitation, and, if possible, expel them from the vicinity. Accordingly I commenced cutting over the premises, and had proceeded as far as two-thirds the way down the mount on which my dwellings stand, when, beneath a shelving rock of decomposing granite, their haunt was discovered. They had been roused by the noise and efforts of the workmen, and had come forth in incalculable numbers for defence, literally blackening the surrounding grass and shrubbery. Lines of ants, going and coming agreeably to the rules of their order, were running in opposite directions. Their paths were very distinct and well trodden, of about an inch in width. In other directions were seen covered ways forsaken, the object of their formation no longer existing,—no prey having been discovered, or, if found, being disposed of,—and other regions lying open for exploration. Their numbers could not be computed; millions on millions seemed to be there, besides thousands that were going and coming with astonishing speed and alacrity.

In attempting their destruction I adopted the mode of the natives, which is, to ignite on the spot a collection of the dried leaves of a species of *Corypha* (Fan Palm of this coast), about six feet in diameter, and dried grass, with other combustible matter. A fire of great intensity was thus kindled, which continued to burn for considerable time. This I supposed would be the last of our troublesome neighbours. Two days after, however, on going to the spot for the purpose of examining into their domicile, I was surprised to see a tree at a short distance, about eighteen inches in diameter, to the height of four feet from the ground, with the adjacent plants and earth, perfectly black with them. From the



lower limbs (four feet high) were festoons or lines of the size of a man's thumb, reaching to the plants and ground below, consisting entirely of these insects; others were ascending and descending upon them, thus holding free and ready communication with the lower and upper portions of this dense mass. One of these festoons I saw in the act of formation; it was a good way advanced when first observed: ant after ant coming down from above, extending their long limbs and opening wide their jaws, gradually lengthened out the living chain till it touched the broad leaf of a *Canna coccinea* below. It now swung to and fro in the wind, the terminal ant the meanwhile endeavouring to attach it by his jaws and legs to the leaf; not succeeding, another ant of the same class (the very largest) was seen to ascend the plant, and, fixing his hind legs with the apex of the abdomen firmly to the leaf under the vibrating column, then reaching forth his fore legs and opening wide his jaws, closed in with his companion from above, and thus completed the most curious ladder in the world.

The line of migrating ants from their former habitation was still continued. When first observed it was composed of individuals of all sizes, pupæ, eggs, &c. commingled in the act of transportation. The cause of this assemblage on the outside was the small dimensions of their recently adopted domicil. There was evidently a cavity under the tree, but not of sufficient size for their numbers; they were therefore busily engaged in enlarging it suitably for their accommodation. The quantity of dirt thrown up in the process was remarkably small. In about two hours I visited the spot again, when the hanging lines or festoons were gone, and about half of the mass also; some below the surface, others on their predatory excursions. One of their paths I traced to a distance of about twenty rods, when I was prevented from going further by a thicket. Their course was easily followed by their beaten track and the arched way, the latter of which was very imperfect, consisting of clay in exposed places, and of grass, sticks, leaves, &c. whenever they could be made to answer the purpose. The line of ants was very much broken and irregular, many of them being gathered into groups in the grass and in holes enjoying the coolness of the shade, waiting for the arrival of evening in which to renew their labours.

Combustible matter was again applied, and it was not long before a dense column was seen issuing from under the opposite side of the tree, observing their usual order and arrangement. The day was cloudy, a little rain falling; there was therefore no need of the clayey arch; but the larger class, arranging themselves

on either side as before described formed the substitute. Under this arch, armed on all sides with sharp claws, and fierce, hooked, open jaws, "the feeblers folk," or, as my native interpreter said, the women and their children, passed rapidly forward in conscious safety. Others of the largest class appeared in the main line at different distances carrying nothing, yet acting no unimportant part. They would occasionally step out of the line and return, as if holding communication with their comrades behind; then, taking their places as before, march on with all their former celerity. Others again of the same class were seen on the outside, running here and there, then stopping, elevating their heads to a point above the others, stretching forth their fore legs, opening wide their jaws, and twirling in every direction their long antennæ, as if in apprehension of danger.

I visited them again the next morning, when I found them still engaged in removing. Thousands and tens of thousands must have been destroyed by the two fires, and yet apparently their numbers were undiminished. I have not on this or any other occasion detected a winged individual, though it is the season when such are to be found in all communities of ants not apterous.

They carry their pupæ and prey longitudinally under their bodies, held firmly between their mandibles and legs, the latter of which are admirably calculated by their length and slenderness for this purpose. The freedom and ease with which they carry their burthen is truly surprising. I have seen the third class, or workers, with pupæ of the first class, or soldiers, certainly as large again as themselves; and, again, with prey twice or more their size, moving with as great a degree of celerity as we should suppose them capable of doing without any burthen.

Their mode of biting differs from that of the soldiers among the *Termes*. The mandibles of the latter are flat and sharp, and move in a cross direction, cutting in the manner of scissors. The mandibles of the Driver of the first class are very prominent and formidable, strongly hooked, having one tooth; those of the second class are flatter, sharper, and armed with two strong teeth, the edges finely serrated, and admirably calculated for lacerating and cutting muscular fibre. The onset of the former is with a grasp that causes their victim to start and wince as if life were in danger; their mandibles are fixed so strongly into the flesh, and their hold retained with such pertinacity, that a separation is effected often only by a dismemberment of the body. If permitted to retain their hold, the motion of their jaws is alternately from one side to the other, penetrating deeper and deeper at every stroke. With



the second class there is not only this gradual penetration, but at the same time a lacerating and cutting of the flesh, with an approximation of the jaws at each effort. This difference in their form and motion in the two classes led me to infer a difference of duties or office in their economy. This impression has been confirmed by repeated observations. To the first class, it would appear, is assigned the defence of the community; it is theirs also to attack and disable their prey. The second lacerate and cut the flesh, and are assisted by the first in tearing it off. Upon the third, who appear to be especially the labourers, devolves the burthen of transportation, whether of prey or pupæ. They are seen to be assisted often by the second class, and, when the prey is too large for either, the first is called in. In the small vial sent herewith will be found the different classes, as they were captured in the act of transportation, with the different articles of prey had at the time in their jaws. But one specimen of Class 1 will be found among them; this was captured with the leg of a locust, evidently just taken and rent asunder (which is in the vial), too large to be transported by the smaller classes.

Whenever a stream of water intercepts their course in their excursions and migrations, if it should not be extensive they compass it, but if otherwise, they make a line or chain of one another, gradually extending themselves by numbers across, till a connection is formed with the opposite side, and thus a bridge is constructed, over which the main body passes in safety.

There is another habit equally interesting that may be mentioned in this connection. It has been asserted of other species of the *Formicidæ* in South America, though doubted by *in-door* naturalists at home. Our seasons are divided into "wet" and "dry," each making up in a general way half of the year. During the former we frequently have violent and continued rains, so that the low grounds, either directly from this cause, or the sudden swelling of the rivers, are overflowed for days. The Drivers delight in rather low localities, generally on the side, but near the base of hills; consequently they are liable to be driven from their haunts for self-preservation. In such an emergency they throw themselves into a rounded mass, deposit their "feebler folk," pupæ and eggs in the centre, and thus float upon the water till a place of safety is reached, or the flood subsides. Even in situations beyond this overflow they must be deluged in their holes for days, so copious and incessant are the rains at times; and one would suppose that, under such circumstances, vast numbers must perish. Some undoubtedly do; but the Lord, in this as in other orders in

the animal kingdom, has pursued a system of compensation beautifully illustrative of His goodness, and the minuteness of His Providential care over even the meanest of His creatures. As He has endowed this insect with a high degree of life, so He has given to it a corresponding degree of tenacity, thus enabling it to exist under the many unfavourable circumstances incident to its habits. Feeling assured that such was the fact, I commenced a series of experiments in proof of the point. An individual of the largest class was submerged to the bottom of a glass of water, where it struggled for about three-fourths of an hour, then apparently expired. It revived in about ten minutes after it was taken out, exhibiting about as much vitality and ferocity as before. It was re-submerged at 1 P.M., and taken out after 6 P.M., with like results. It was submerged the third time, and then permitted to remain for twelve hours or more. It revived on being taken out, so far as to move about on its side, and continued to exhibit signs of life for twelve hours more, when it expired. Others that were permitted to rise to the surface, and remain, survived some time longer.

Another fact, illustrating their tenacity of life, may here be stated. The head of one of the largest class, when dissevered from the body, grasped the finger of an attendant so furiously as to cause an immediate flow of blood. It was kept in a glass tumbler from 3 P.M. till the next morning at 8 o'clock, when the finger was again applied, and apparently as severe a wound as before inflicted. Another individual of the same class was decapitated at 7 A.M., and at half-past 9 the next morning,—26½ hours from the time of decapitation,—a piece of newspaper was held between the jaws, which it grasped and retained with considerable force. I then applied the small finger of my right hand, which it bit severely; indeed so powerful was the grasp that the point of the mandibles met beneath the cuticle. It then partly withdrew one mandible, and pointing it more perpendicularly, penetrated deeper, then the other, and thus at every alternate stroke giving to the mandible a direction more vertical, wounding and cutting wider and deeper precisely in the manner of the insect in possession of all its parts and powers. The sensation at each thrust was like that of a pin, and equally painful; and when the mandibles were withdrawn the blood flowed as freely. This head continued to give signs of life for more than 36 hours after decapitation. The body to which it belonged lived still longer,—more than 48 hours!

I know of no insect more ferocious and determined upon vic-

tory. They fiercely attack any thing that comes in their way,—“conquer or die” is their motto. I have known a live coal of fire held before them, at which, though so obnoxious to heat, they rushed with indescribable ferocity, releasing their hold only in death. They have no eyes visible through my glasses, which, however, are not powerful. They seem to be less under the influence of the sense of smelling than of hearing or feeling.

If taken a few feet from their habitation they seem to be at a loss to know the way to return; some will at last succeed in arriving at home, others not. To decide the point whether they detected the proximity of prey by the sense of smell or not, I placed near one of their domicils, first a small bird, dead, then a barn-door fowl, but not an individual was attracted to the spot. They were roused several times by knocking on the covering of their habitation; this brought them forth in large numbers, when they ran about in different directions in search of the intruder, coming very near to their favourite food, but not one in contact with it. The bird was now brought within two, then one foot of their nest, both times with the same success. At last one or two, as if by accident, found it out, and laid hold of the feathers in a great rage, then retired within their habitation. I waited a long time to see if any intelligence would be conveyed of the proximity of their favourite prey, but no evidence of the fact appeared. I roused them again, and put some of the largest and of the second class upon the bird; they jumped about in great perturbation and rage, pulled vigorously at the feathers, then biting into the flesh, at last disappeared without further effort. No intelligence being yet conveyed that food was at hand, I brought them forth in still greater numbers, and thrusting the fowl down among them, held it there till it was well covered, and then withdrew it to a distance of about two feet, to observe their proceedings. As the fowl was drawn back many ants were left on the intervening ground, and thus free communication was soon established between it and their domicil. A few of the largest class, which are always the first to come forth for defence, were seen running to and fro, forming a line which, when completed, was seen to be composed mostly of individuals of classes Nos. 3 and 2, No. 1 evidently taking management of the others. The first step in their operations was to clear the path of all moveable obstructions. This was done chiefly by the third class; some of No. 2, and occasionally No. 1, coming in when large obstacles were to be removed. It was intensely interesting to see these little creatures gaining victory, by one process after another, over comparatively mountain obstacles

in their way; greater difficulties only rousing them to greater effort. Here would be seen one dragging along a stick four times its length; there, another, pushing, then grasping and pulling along a stone many times its weight; and, when more power was requisite, others coming in to his aid, all knowing that a work was to be performed, and each doing promptly his part. Thus were stones, sticks, leaves and grass successively withdrawn from within their line, and deposited at a distance from the scene of their labours. A regular, distinct footpath was soon made visible, and in readiness for the quick transportation of their prey. In the meantime the largest, with an equal number of the second size, were busily engaged upon the head of the fowl, depriving it of its feathers. This promised to be a slow and tedious operation; but the gradual increase of feathers, and the denuded skin, were sure indications of their success. The feathers were *pulled out*; sometimes one, two and three ants would be seen tugging most lustily at one, but I am inclined to think that the largest feathers were extracted by lacerating the flesh at their root, though I was not able to decide this point fully. Those that fell in their way were borne off by the smaller ants; others were made to answer as a covering to their pathway, being held together by the largest size or soldiers. The operation of *picking* began at the beak, and was gradually extended backward. The neck being half stripped, they then began the work of laceration at the eyes and ears. It was some time before any visible impression was made, but at last, though by no means so expeditiously as I expected, deep cavities appeared, and muscles, membranes and tendons were reduced and borne off to their habitation. The juices, and a portion of the muscular fibre, I think, must be consumed on the spot at such times, though the largest portion is carried to their domicil.

At first there was considerable confusion in the lines. They seemed to be incapable of keeping the right path, and even missed the various entrances to their domicil. Individuals of the largest class were seen to arrange themselves on either side, between whom the lines of workers passed and repassed with a good degree of order. These were acting evidently the part of guides rather than guards, though at times they acted in the latter capacity also. They would place their abdomen horizontally on the ground, and laying hold of fixed points with their hind feet, (which together thus acted as a fulcrum,) elevate the anterior portion of their bodies to the highest point, open wide their jaws, and stretch forth their antennæ, which for the most part were fixed, as if in the act of listening and watching for approaching

danger. They would occasionally drop their bodies to the ground again, run off to one side, and fiercely work their jaws and antennæ, as if having detected some strange sounds in the distance. Discerning nothing, they would quickly return to their posts and resume their positions, thus acting as scouts. The hour for fulfilling appointments having arrived, I left, designing to make further experiments; but on my return I found that the fowl had been stolen by some of my covetous, perhaps hungry parishioners, who excused the act of aggression by saying that the Drivers were their most grievous enemies, often depriving them of the two things they mostly loved,—*poultry* and *sleep*; and that I was entertaining them with undue hospitality; others more jokingly said, that I was making them my *Fetish*, and offering to them *sacrifices* of birds and fowls.

Being in the immediate vicinity of our teacher's house they became troublesome, killing six of his chickens in one night; we had therefore to decide forthwith upon their destruction. This was effectually and instantly done by a few gallons of boiling water poured into their domicile.

Like all their habitations that I have seen, this was on the side of a hill, and consisted of a slight excavation about eighteen inches in depth, made for the interment of a human body, according to the custom of this tribe, covered over with the fragment of an old canoe. On removing this covering vast numbers of the ants with their pupæ were discovered dead, and the spot, which might be called their *nidus*, occupying a space of about eighteen inches in diameter. The soil was composed of clay and small stones; the latter were abundant, the interstices of which seemed to be their only cells. In every instance that has fallen under my observation the soil selected has been of this loose character, and the interstitial spaces so occupied.

This was the smallest community I had seen; whether it was a colony or not I cannot say, but it was supposed to be the remains of the one destroyed by fire, as no other was known to be in our neighbourhood.

They do not treasure up their food for any length of time, which may be inferred from the construction of their domicile. They go forth in search of prey at *all seasons*, but more especially during the "*rains*," which corresponds to the winter of temperate climates. Their more frequent appearance at this season is accounted for on the ground that the weather then is generally cloudy and cool; perhaps, also, they are driven forth by the accumulation of water in their habitation.

They are not without their uses in the economy of nature. They keep down the more rapid increase of noxious insects and smaller reptiles; consume much dead animal matter, which is constantly occurring, decaying, becoming offensive, and thus vitiating the atmosphere, and, which is by no means the least important in the Torrid Zone, often compelling the inhabitants to keep their dwellings, towns, and their vicinity, in a state of comparative cleanliness. The dread of them is upon every living thing.\* It may be literally said that they are against every thing and every thing against them. I have known my dog, on meeting them in the road, instead of running any risk by leaping over them, go a great distance round to avoid their well-known bite. My donkey has more than once stopped so suddenly and turned, as to throw me over her head, or to one side, and when urged forward, leaped far over the line.

They will soon kill the largest animal if confined. They attack lizards, guanas, snakes, &c. with complete success. We have lost several animals by them,—monkeys, pigs, fowls, &c. The severity of their bite, increased to great intensity by vast numbers, it is impossible to conceive. We may easily believe that it would prove fatal to almost any animal in confinement. They have been known to destroy the *Python natalensis*, our largest serpent. When gorged with prey it lies powerless for days; then, monster as it is, it easily becomes their victim. It is universally said by the natives that this serpent, having disabled his victim by the fearful process of constriction, makes a wide sweep in the vicinity in search of the *Drivers*. If he discovers them, he abandons it to their more numerous jaws; but if not, he returns to the work of engorgement. This account, whether true to the letter or not, gives a good idea of the dread with which it inspires the different orders of animals.

In a recent attack they killed a snake under my house about four feet long. It made its way out, but, seemingly incapable of progression, could not make its way off. Its motions were such as to lead to the conclusion that it was blind. It writhed and twisted instead of going forward, giving the ants time to accumulate, and thus by numbers overpower it. It is very probable that, with one stroke of their jaws, they destroyed the power of vision, and brought it immediately within their grasp.

Their entrance into a house is soon known by the simultaneous

\* It is stated by my native interpreter that a certain species of *Julus*, which emits a peculiar odour, if thrown into their domicil, will cause them to abandon it. Its truth remains to be proved.



and universal movement of rats, mice, lizards, *Blapsidæ*, *Blattidæ*, and of the numerous vermin that infest our dwellings. Not being agreed, they cannot dwell together, which modifies in a good measure the severity of the Drivers' habits, and renders their visits sometimes (though very seldom in my view) desirable.

Their ascent into our beds we sometimes prevent by placing the feet of the bedsteads into a basin of vinegar, or some other uncongenial fluid; this will generally be successful if the rooms are ceiled, or the floors overhead tight, otherwise they will drop down upon us, bringing along with them their noxious prey in the very act of contending for victory.

They move over the house with a good degree of order unless disturbed, occasionally spreading abroad, ransacking one point after another, till, either having found something desirable, they collect upon it, when they may be destroyed "en masse" by hot water; or, disappointed, they abandon the premises as a barren spot, and seek some other more promising for exploration. When they are fairly in we give up the house, and try to await with patience their pleasure, thankful, indeed, if permitted to remain within the narrow limits of our beds or chairs.

They are decidedly carnivorous in their propensities. Fresh meat of all kinds is their favourite food; fresh oils they also love, especially that of the *Elais guiniensis*, either in the fruit or expressed. Under my observation they pass by milk, sugar, and pastry of all kinds, also salt meat; the latter, when boiled, they have eaten, but not with the zest of fresh. It is an incorrect statement, often made, that "they devour every thing eatable" by us in our houses; there are many articles which form an exception. If a heap of rubbish comes within their route, they invariably explore it, when larvæ and insects of all orders may be seen borne off in triumph,—especially the former.

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